

In re Application of: Malik et al.  
Serial No.: 10/599,385  
Filed: August 9, 2007  
Final Office Action Mailing Date: August 20, 2010

Examiner: McGraw, Trevor Edwin  
Group Art Unit: 3752  
Attorney Docket: 37705  
Confirmation No.: 7857

**In the Claims:**

1. (Currently Amended) A chemical mixing device, comprising:  
  
a flow generator operative to provide at least two streams of chemicals; and  
  
a mixing chamber, including at least two inlets adapted to receive the at least two streams of chemicals and an outlet through which a mixture of the streams of chemicals is ejected from the mixing device, wherein the mixing chamber has an open state in which the chemicals are mixed and a closed state in which the volume of the mixing chamber is less than a fifth of the open state volume, and wherein the mixing chamber remains in the closed state when the flow generator does not operate.
2. (Original) A mixing device according to claim 1, wherein the mixing chamber has a substantially zero volume in the closed state.
3. (Original) A mixing device according to claim 1, wherein the mixing chamber has walls that are biased in a closed state in which the walls are pressed against each other.
4. (Original) A mixing device according to claim 3, wherein the walls of the mixing chamber are biased in the closed state by a pressure greater than required to keep the mixing chamber in the closed state.
5. (Original) A mixing device according to claim 1, wherein the mixing chamber has a volume smaller than a cubic millimeter in the closed state.

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6. (Original) A mixing device according to claim 1, wherein the mixing chamber has a volume of less than 20 cubic millimeters in the open state.

7. (Cancelled)

8. (Cancelled)

9. (Original) A mixing device according to claim 1, wherein the mixing chamber comprises a flexible material.

10. (Original) A mixing device according to claim 9, wherein the mixing chamber comprises a compressible material.

11. (Original) A mixing device according to claim 9, wherein the mixing chamber material has a hardness of less than 60 shore A.

12. (Original) A mixing device according to claim 9, comprising a rigid structure which continuously applies a closing force to the mixing chamber.

13. (Original) A mixing device according to claim 9, comprising an elastic ring which continuously applies a closing force to the mixing chamber.

14. (Original) A mixing device according to claim 9, comprising a pressure unit which controllably applies a closing pressure on the mixing chamber, when the mixing chamber is in the closed state, but does not apply the closing pressure when the mixing chamber is to be in the open state.

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15. (Original) A mixing device according to claim 1, wherein the flow generator and a nozzle containing the mixing chamber are connected to each other and are adapted to be replaced together.

16. (Original) A mixing device according to claim 1, wherein a nozzle containing the mixing chamber and containers from which the flow generator extracts the chemicals are adapted to be replaced together.

17. (Original) A mixing device according to claim 1, comprising at least two channels which lead the chemicals to the mixing chamber, wherein the channels have a decreasing cross-section as they approach the mixing chamber.

18. (Original) A mixing device according to claim 1, comprising at least two channels which lead the chemicals to the mixing chamber, wherein at least a portion of the channels is held in a closed state when the flow generator does not operate.

19 – 22. (Cancelled)

23. (Original) A mixing device according to claim 1, wherein walls of the mixing chamber are pressed against each other in the closed state.

24. (Original) A mixing device according to claim 23, wherein walls of the mixing chamber are pressed against each other in the closed state, by an external force.

25 – 39. (Cancelled)

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40. (Currently Amended) A chemical mixing device, comprising:

a flow generator operative to provide at least two streams of chemicals; and

a mixing chamber, including at least two inlets adapted to receive the at least two streams of chemicals and an outlet through which a mixture of the streams of chemicals is ejected; and

a flow regulator which prevents flow into the mixing chamber unless the chemical streams from the flow generator have a pressure above a threshold of at least 2 bar, and wherein the flow regulator comprises portions of flexible channels leading chemicals to the mixing chamber which are pressed into a closed position.

41. (Cancelled)

42. (Original) A mixing device according to claim 40, wherein the flow regulator prevents flow into the mixing chamber unless the chemical streams from the flow generator have a pressure above a threshold of at least 4 bar.

43 – 57. (Cancelled)

58. (Previously presented) The mixing device according to claim 1, wherein the mixing chamber has a volume of at least 3 cubic millimeters in the open state.

59. (New) A chemical mixing device, comprising:

a flow generator operative to provide at least two streams of chemicals; and

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a mixing chamber, including at least two inlets adapted to receive the at least two streams of chemicals and an outlet through which a mixture of the streams of chemicals is ejected from the mixing device, wherein the mixing chamber has an open state in which the chemicals are mixed and a closed state in which the volume of the mixing chamber is less than a fifth of the open state volume, and wherein the pressure of the streams of chemicals move the mixing chamber into the open state.

60. (New) A chemical mixing device, comprising:

a flow generator operative to provide at least two streams of chemicals; and

a mixing chamber, including at least two inlets adapted to receive the at least two streams of chemicals and an outlet through which a mixture of the streams of chemicals is ejected from the mixing device, wherein the mixing chamber has an open state in which the chemicals are mixed and a closed state in which the volume of the mixing chamber is less than a fifth of the open state volume; and

a rigid structure which continuously applies a closing force to the mixing chamber.

61. (New) A chemical mixing device, comprising:

a flow generator operative to provide at least two streams of chemicals; and

a mixing chamber, including at least two inlets adapted to receive the at least two streams of chemicals and an outlet through which a mixture of the streams of chemicals is ejected from the mixing device, wherein the mixing chamber has an open

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state in which the chemicals are mixed and a closed state in which the volume of the mixing chamber is less than a fifth of the open state volume; and

an elastic ring which continuously applies a closing force to the mixing chamber.

62. (New) A chemical mixing device, comprising:

a flow generator operative to provide at least two streams of chemicals; and

a mixing chamber, including at least two inlets adapted to receive the at least two streams of chemicals and an outlet through which a mixture of the streams of chemicals is ejected from the mixing device, wherein the mixing chamber has an open state in which the chemicals are mixed and a closed state in which the volume of the mixing chamber is less than a fifth of the open state volume; and

at least two channels which lead the chemicals to the mixing chamber, wherein at least a portion of the channels is held in a closed state when the flow generator does not operate, and wherein a pressure holding the channels closed is greater than a pressure holding the mixing chamber in the closed state.

63. (New) A mixing device according to claim 62, wherein the pressure holding the channels closed gradually decreases along the channels as the channels approach the mixing chamber.

64. (New) A mixing device according to claim 62, wherein the pressure holding the channels closed varies due to variations in the walls of the channels.

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65. (New) A mixing device according to claim 62, wherein the pressure holding the channels closed varies due to variations in an external member that applies pressure to the walls of the channels.